Bridges to Stem Cell Research and Therapy: A Talent Development Program for Training Diverse Undergraduates for Careers in Regenerative Medicine

Grant Award Details

Bridges to Stem Cell Research and Therapy: A Talent Development Program for Training Diverse Undergraduates for Careers in Regenerative Medicine

Grant Type: Bridges

Grant Number: EDUC2-12734

Project Objective: This program provides stem cell training for up to 10 undergraduate students per year at CSU Fullerton and its partnering institutions. Training includes coursework, patient engagement opportunities, outreach activities (7 months) followed by and Advanced Techniques course and then a 12 month research internship. This program makes special efforts to recruit and support students that have lower GPAs and lack research experience but have desire and motivation to participate in the biomedical sciences.

Investigator:

Name:	Nilay Patel
Institution:	Cal State Univ, Fullerton
Type:	PI

Award Value: $3,606,500

Status: Active

Grant Application Details

Application Title: Bridges to Stem Cell Research and Therapy: A Talent Development Program for Training Diverse Undergraduates for Careers in Regenerative Medicine

Public Abstract: Designed specifically for a highly diverse student population, this Bridges program focuses on selecting students who are genuinely interested in advancing the field of regenerative medicine and providing them with high-impact practices such as hands-on research training, product-oriented coursework, one-on-one mentoring, soft skills development, innovative community outreach programs, and personalized patient engagement activities. At least ten biology or biochemistry majors will be selected as scholars annually, for up to 50. Additional funded positions may be available from our partner biotechnology companies.

The program has been configured with inclusive practices that lower the barriers to participation: there is no minimum GPA or previous research experience required. There is also an increased emphasis on the applicants' desire to help advance biomedical innovation leading to therapy. Accepted students then benefit from the presence of multiple mentors in the training as well as at the internship sites.

The program will consist of a seven-month training on the home campus, followed by a 12-month internship in a stem cell research lab at one of four internship host institutions. Based on our previous success, two biotechnology companies have indicated an interest in sponsoring an intern, which would allow the program to train additional students. All coursework can be applied toward the B.S. in biological science or a minor in cell and molecular biology and thus is fully integrated into B.S. degree programs.

The preparatory training on the home campus will consist of 1) five biology courses to strengthen the fundamentals scholars will need for their research internships, 2) an advanced cell culture techniques course taught at the internship site, 3) a hands-on research project in a faculty lab to impart basic knowledge of research lab operations, 4) a proseminar to prepare scholars for internships, 5) patient engagement activities, 6) five workshops to broaden their horizons and soft skills, and 7) community outreach and education activities.

The scholars will then engage in a full-time, year-long research internship, carrying out a project focused on development of stem cell-based therapies at a partnering internship host institution, under the direction of a research mentor. All four internship host institutions have been awarded CIRM grants. Through the internships, scholars will gain additional project-specific technical skills as well as the conceptual underpinnings necessary to solve problems in a particular stem cell research area.

The overarching goal will be to fulfill all of CIRM's objectives for Bridges 3.0. In the process the program will create a cadre of diverse, highly capable interns who have the knowledge, proficiency, and desire to contribute to the development of stem cell-based therapies and go on to advanced degrees and careers in related fields.

Statement of Benefit to California:

CIRM's role in advancing stem cell biology has generated scores of opportunities for biotech innovation and medical revolution in California. The state has become a world leader in regenerative medicine, spawning new companies and creating well-paid jobs that require highly qualified Californians to fill them.

Traditional biology curriculum does not provide the broad perspectives or sufficient hands-on experiences to prepare an undergraduate for an entry-level position in a biotech company run by experienced researchers with PhDs. Bridges programs like ours will help address the gap between what an undergraduate student knows and what the biotech companies seek in their new hires. Recognition of our past Bridges interns has prompted company executives to create a path for our interns to join their organizations.

Over the next five years, our Bridges program will train 50 or more undergraduate biology and biochemistry majors as scholars and researchers with hands-on training in cell, molecular, and stem cell biology techniques. We will seek undergraduates from our diverse student population who come from different socioeconomic backgrounds and/or are the first in their family to attend college, and then train them to be exceptional interns in the labs of world leaders at our partnering institutions. Many of our Bridges alumni are pursuing advanced degrees, and some have already completed doctoral and professional degrees. This, in turn, is likely to increase the number of stem cell investigators and support staff in the future workforce, and having qualified employees will increase innovation and productivity in California's stem cell-based companies. Historically, over 70% of students from this campus remain in California, which means much of the workforce talent will be retained locally. In time, this will likely lead to the translation of discoveries into new therapeutics and diagnostics, benefiting Californians as well as people around the world. Successful stem cell-based companies, staffed by highly qualified scientists and technicians, will also contribute significant tax revenue to the state and enrich California's economy.

Moreover, selecting diverse students interested in regenerative medicine will allow underrepresented populations to find employment in one of the fastest-growing sectors of our economy. Their participation is one approach by which communities that have been excluded from high-tech jobs may engage in the future of medicine. This is of enormous benefit to our state because these researchers will be able to bring diverse thoughts, opinions, beliefs, perspectives, and problem-solving skills to the rapidly growing stem cell research enterprise.

Our community outreach approaches will also engage large numbers of students and members of the community to learn about advances in stem cell biology, which will help develop an informed citizenry within California.
